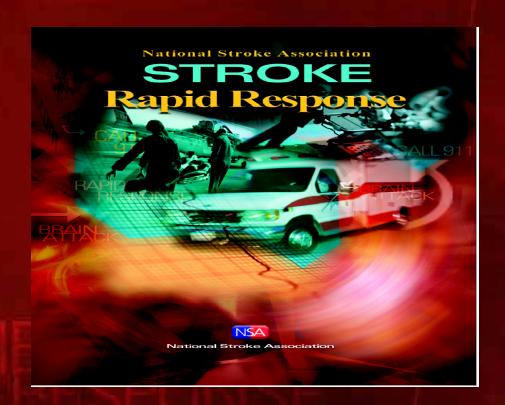
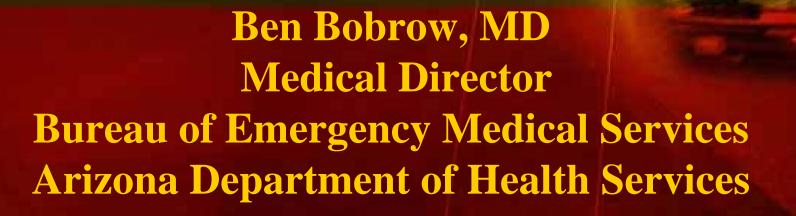
Phoenix Metro Matrix of Stroke Centers: "It's about TIME"











DISCLOSURE

Relevant Financial
Relationship(s)
None

Off Label Usage
None



Objectives

- Evolution of stroke systems of care and their current status in Arizona
- Integration of Arizona's EMS into the stroke chain of survival
- Update EMS providers on the latest stroke treatment options
- Promote a standard prehospital stroke screening tool for EMS providers



Stroke in the U.S.

- Over 750,000 Americans will experience a stroke this year
- 163,000 will die of stroke; one of every 14 deaths
- Over 4 million survivors with two thirds of them struggling with a range of disabilities
- Annual costs are over \$57 billion



Stroke in Arizona

- Over 14,000 strokes in Arizona last years
- 1998-- 7,091 dx with stroke in Maricopa Co.
- 1998-- 2,947 ischemic strokes in Maricopa Co.
- 1998-- 4 patients received IV-tPA for stroke





Until Recently Stroke has been an Invisible Disease!

- Confusion regarding stroke warning signs
- Lack of knowledge regarding risk factors
- Only 40% of U.S. public surveyed considered stroke an emergency; 3% stated that they would "wait and see whether they improved" before calling for help (NSA, 1995; 1998)





"He's had a Stroke. Get some of the King's horses and a few of the King's men."

Arizona

Department of Health Services

Stroke Care History

- 1995- NINDS- TPA therapy for ischemic stroke
- 1996- EM controversy over TPA in stroke
- 1997- Brain Attack Coalition (BAC) formed
- 2000- Primary Stroke Center criteria published
- 2004- European Stroke Initiative
- 2005- Comprehensive Stroke Center criteria published
- 2006 Over 220 JCHACO Certified PSCs



2005 ASA Guidelines

"Healthcare providers, hospitals and communities must develop systems to increase the efficiency and effectiveness of stroke care."

Recommendations for the establishment of stroke systems of care ASA Task Force; *Circulation*. 2005;111:1078-1091

Departmen

Primary Stroke Center

- 24/7 Acute Stroke Teams
- Stroke Unit
- Written care protocols
- Integrated emergency response system
- 24/7 CT/Lab/Cardiac studies
- Administrative support
- Strong leadership/medical director
- Continuing education



Comprehensive Stroke Center

- Healthcare personnel with specific expertise in multiple disciplines including vascular neurology, vascular neurosurgery, and endovascular surgical neuroradiology
- Advanced neuroimaging capabilities such as MRI/cerebral angiography/TCD
- Surgical and endovascular techniques, including clipping/coiling of intracranial aneurysms, carotid endarterectomy/stenting, and intra-arterial thrombolytic therapy/mechanical clot retrieval
- Other specific infrastructure/programmatic elements; critical care unit, stroke registry, research, QA/QI, fellowship training

 Arizona

Department of

Why is EMS an Important Component of a Stroke System?

- EMS is the initial point of contact with the medical system for approximately 50% of stroke patients
- EMS personnel must be able to detect stroke if the rest of the system is to be launched in a timely manner
- EMS protocols often dictate destination
- Stroke treatments are time sensitive



What Often Happens?

- Patients fail to recognize or deny stroke symptoms, thus delaying presentation
- Public fails to use 9-1-1 system
- Lack of consistent use of Prehospital Stroke Scale by EMS causing over and under triage of acute stroke
- Due to local resources patients are transported to hospitals not fully equipped to treat acute stroke



You are driving your car at 75mph and this happens.



What Happens Next?

- You or somebody else (or even your car) notifies 9-1-1.
- Fire agencies, police, EMS all respond with lights and sirens
- Numerous treatment modalities are begun
- You are transported by air or ground to a designated trauma center based on:
 - Your anatomic injuries, physiologic state and MOI
 - Local trauma center resources



Why do all these things happen?

- Trauma systems have been developed and refined over many years
- Well done studies show an outcomes benefit
- Most states have statutory and/or regulatory requirements for trauma systems including direct triage to TCs bypassing non-trauma centers



Now instead of a MVC, you have a Stroke, what happens?

- Hopefully you or somebody else notices and calls 9-1-1 (or waits for you to get better, or takes you to your doctor 3 days later)
- EMS responds, often no lights and sirens
- Limited treatment is begun
- You are transported to the closest ED or ED of your choice or one that has a bed



Why is it Different for Stroke?

- Stroke systems are in evolution and not yet fully developed
- Few states have statutes or regulations requiring EMS participation
- No outcomes benefit of EMS bypass to stroke centers has been shown

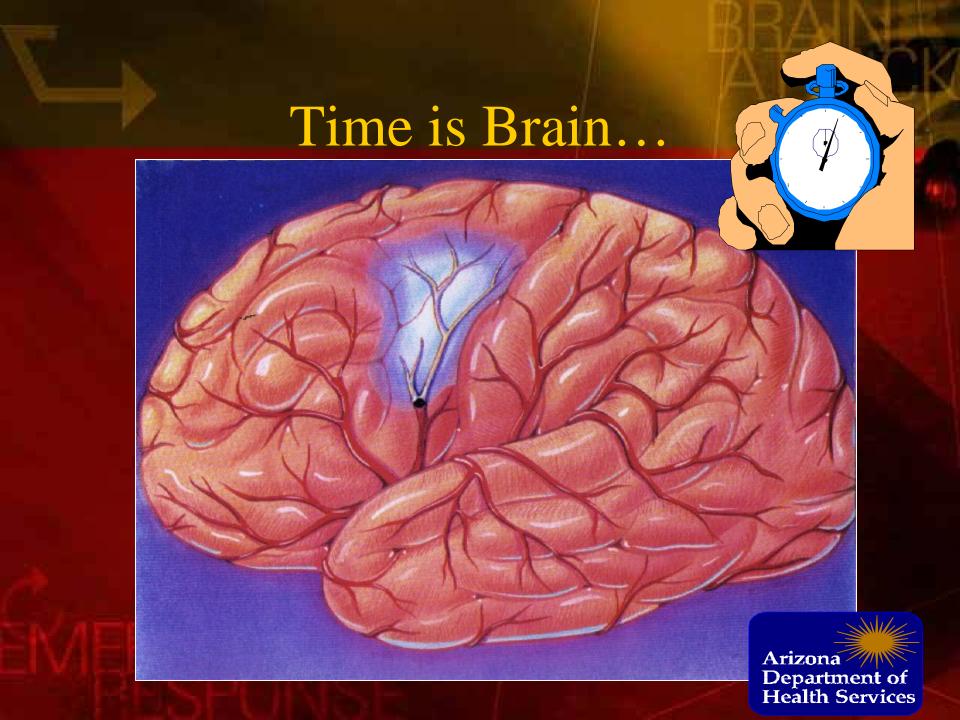


Why is This?

#1- STROKE SYSTEM INFORMATION
HAS NOT BEEN ADEQUATELY
DISSEMINATED WITHIN THE EMS
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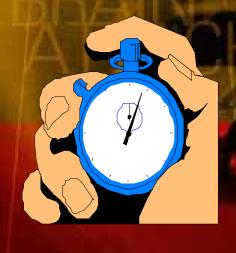
#2 – WE NEED A COMPREHENSIVE STATEWIDE SYSTEM IS NECESSARY





Golden 90 Minutes









0 10 20 30 40 50 60 minutes



80 90

Arizona
Department of
Health Services

Phoenix Metro Matrix of PSCs



Establishing Emergency Medical Services for a Metropolitan Matrix of **Primary Stroke Centers: The Phoenix Experience**

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Bart M. Dema erachally, MD, MSc, FRCPC, Bentley J. Bobrow, MD - Mayo Clinic - Scottsdale, Arizona; Mary Paulsen, MSN, RN - American Stroke Association, Pacific Mountain Affiliate - Tempa, Arizona; Phoenix Operation Stroke Executive Committee

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American Stroke Association.

A Division of American



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to identify and transport scute attake patients to PSCs, 8 metropoliten hospitals have met criteria for PSC deal gration, a metropolitan matrix of PSCs became fully

operational in October 2003, and nearly 20% of scute lackers stroke patients are receiving thrombolysis.

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PMSM EMS Goal:

• To provide rapid on-scene evaluation, stabilization, transport and prenotification of acute stroke patients to Primary Stroke Centers capable of state of the art treatment.



International Stroke Conference February 2006





American Stroke Association...











Assessment of the Emergency Medical Technicians that Service the Phoenix Metropolitan Matrix of Primary Stroke Centers

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Assessment of the Emergency Medical Technicians that Service the Phoenix Metropolitan Matrix of Primary Stroke Centers (186 respondents)

- 97% time of Sx onset very important
- 53% 3-hour window for tx with IV-tPA
- 75% identified components of CSS
- 20% would treat HTN in the field with NTG
- 88% of EMTs satisfied with PSC matrix



Conclusion

- EMT attitudes concerning acute stroke are positive.
- EMT stroke knowledge and skills will benefit from an organized system of continuous quality assurance and improvement along with focused repeat training.

Arizona

Department of

Standardizing Prehospital Stroke Education

- Standard term <u>STROKE</u>
- Use of a validated prehospital stroke scale
- Destination Criteria
- Local PSC information
- Case presentations with stroke survivors
- Similar documentation
- Prehospital Stroke CQI process



Prehospital Stroke Scales

- The most commonly used prehospital stroke tools are:
 - Cincinnati Prehospital Stroke Scale (CPSS)
 - Los Angeles Prehospital Stroke Screen (LAPSS)
 - Miami Emergency Neurological Deficit Prehospital Checklist (MEND)



Cincinnati Prehospital Stroke Scale



Facial Droop

Normal: Both sides of face move equally Abnormal: One side of face does not move at all



Arm Drift

Normal: Both arms move equally or not at all Abnormal: One arm drifts compared to the other



Speech

Normal: Patient uses correct words with no slurring Abnormal: Slurred or inappropriate words or mute



FAST STROKE ALERT Program





FAST STROKE ALERT Program

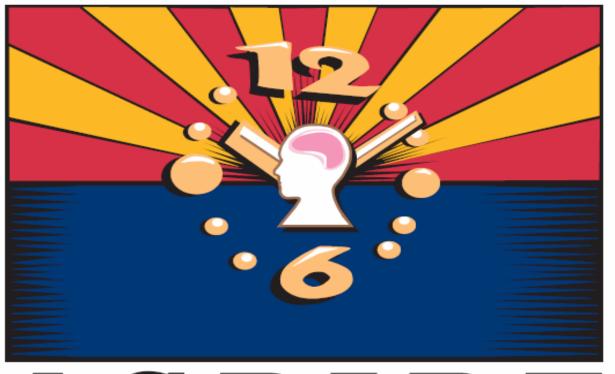
- Pre-notification to expedite system at PSCs
- Initiated by EMS personnel
- ID potential acute intervention candidates
- Maximize both the detection of stroke and the diagnosis of non-stroke causes of neurological symptoms (sz, ethanol, drugs)



FAST STROKE ALERT Program

- ED staff begin process prior to patient arrival
- Stroke Team pager called, CT scan/radiologist/lab
- Especially important during peak season
- Builds EMS partnership and awareness





A.S.P.I.B.E

Acute Stroke Prehospital Identification Registry & Education



ASPIRE Data

- N = 903
- Male 381 (42%) average age: 70.8, age range 21 100
- Female 522 (58%) average age: 72.5, age range 21-103
- Hospital Destination Decision: N = 827
 - 508 to a PSC (61%)
 - 319 to a non-PSC (39%)
- Patient Choice: 292 (60% of this category to a PSC)
- Closest Facility: 426 (56% of this category to a PSC)
- PCS Triage: 77
- Physician Order: 23 (52% of this category to a PSC)
- Divert: 9 (55% of this category to a PSC)
- FAST Score and Destination:
 - 0 = 257 (54% of this score to a PSC)
 - -1 = 173 (61% of this score to a PSC)
 - 2 = 141 (65% of this score to a PSC)
 - -3 = 86 (66% of this score to a PSC)
- Note: 186 records (22%) did not have sufficient documentation to determine FAST score.

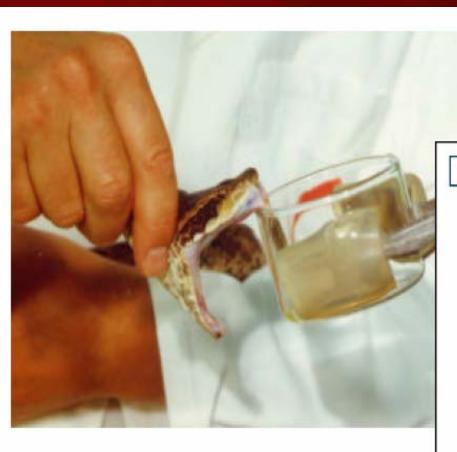


Evolving Stroke Treatments

- Intra-arterial t-PA
- Mechanical Clot Retrieval with MERCI
- Neuroprotective Agents
- Novel Thrombolytics in trials
- Recombinant Factor VIIa



Venom of a Malayan Pit Viper

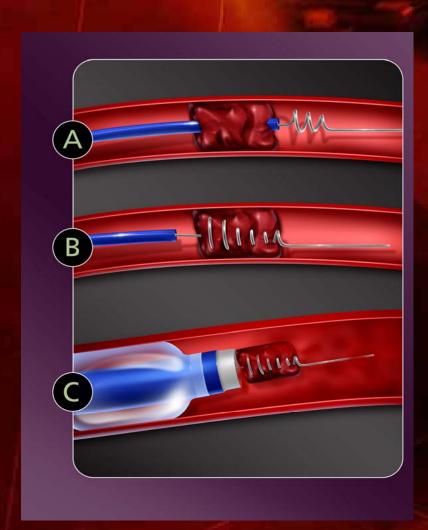


V I P R I N E X¹⁸

Derived from the venom of the Malayan pit viper, Viprinex[™] is a thrombin-like enzyme that is highly specific to fibrinogen. When administered systemically, Viprinex[™] has been shown to rapidly deplete plasma fibrinogen (it is a defibrinogenating agent). The effects are anticoagulation, improved blood viscosity and a secondary fibrinolytic or clot lysing action. Combined, these effects constitute a perfusion strategy that appears to restore and enhance blood flow to the affected area of the brain.

Mechanical Embolus Removal in Cerebral Ischemia





FAST-MAG

Field Administration of Stroke Therapy - Magnesium

- Funded by NIH
- Phase III Clinical Trial
- Early administration IV Magnesium by EMS
- 50% treated < 1 hour
- All treated < 2 hours
- Trial ongoing



Expanding Window of Treatment

STROKE TECHNOLOGIES EXPANDING THE WINDOW OF TREATMENT OPPORTUNITY





S.T.A.R.R.

Stroke Telemedicine for Arizona Rural Residents





Presented by Mayo Clinic College of Medicine

Acute Stroke Care Plan for Arizona

In collaboration with . . .



American Stroke
Association

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Mayo Clinic School of Continuing Medical Education

Thursday, May 25, 2006

COURSE HIGHLIGHTS:

Stroke remains a devastating illness in the United States and in Arizona. New treatments and treatment strategies have arisen that when implemented will improve stroke outcomes. Pre-hospital personnel, nurses, physicians, and hospital administrators are the target audience to improve stroke patient access to the most progressive treatments.

COURSE TOPICS INCLUDE:

- Stroke Epidemiology/Status of Stroke Care in Arizona
- Update on Acute Stroke Care Interventions
- Interfacility Acute Stroke Care
- Emergency Medical Services and Stroke and the Role of the Arizona Department of Health Services in Stroke Care
- Medical/Legal Issues of Acute Stroke
- Stroke Telemedicine

MEETING LOCATION:

Halle Heart Museum 2929 South 48th Street Tempe, AZ 85282

Look for course brochure in the mail in March. The course brochure will be posted at the following website (http://www.mayo.edu) approximately ten weeks prior to the course.

EMS Issues to Address Regarding Stroke Care

- Formalize bypass criteria
- Formalize diversion criteria
- Formalize standard training
- Frequent, consistent EMS updates
- Formalize standard data collection



Key EMS/Stroke Points

- EMS plays a critical role in the emergency care of stroke patients
- Due to the time sensitive nature of stroke, future interventions will involve EMS

- Dissemination of stroke system information to prehospital providers is paramount
- Accurate prehospital stroke data is vital



Thank You!

